U.S. Department
of Transportation
**Research and
Special Programs
Administration**

SEP 7 2000

400 Seventh Street, S.W.
Washington, D.C. 20590

DOT-E 12413

EXPIRATION DATE: **August 31, 2002**

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: CP Industries (CPI)
McKeesport, PA

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the use of certain DOT Specification 3AA, 3AAX and 3T cylinders that have been retested by means other than the hydrostatic retest required in § 173.34(e) for the transportation in commerce of those materials listed in paragraph 6 below. This exemption provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.

b. The safety analyses performed in development of this exemption only considered the hazards and risks associated with transportation in commerce. The safety analyses did not consider the hazards and risks associated with consumer use, use as a component of a transport vehicle or other device, or other uses not associated with transportation in commerce.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR § 173.34(e): the introductory paragraph, the Table, and paragraphs (e)(1), (e)(3), (e)(4), (e)(8), (e)(14), (e)(16), and 173.302(c)(2), (3), (4), and (5) in that only an acoustic emission/ultrasonic examination (AE/UE) is performed in place of the hydrostatic pressure test and internal visual examination as prescribed herein.

5. BASIS: This exemption is based on the application of CPI dated January 10, 2000 and a supplemental e-mail dated June 29, 2000, submitted in accordance with § 107.105 and the public proceeding thereon.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Materials Description	Hazard Class/ Division	Identification Number	Packing Group
Liquefied or nonliquefied compressed gases, or mixtures of such compressed gases, authorized in the HMR for transportation in DOT 3AA, 3AAX and 3T cylinders.	Specific Hazard Class and Division applicable to the compressed gas or gas mixture to be shipped.	As listed in 49 CFR Part 172.101 for specific compressed gas or gas mixture.	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packagings prescribed are DOT 3AA, 3AAX or 3T cylinders each having an outside diameter equal to or greater than 18-inches. The cylinders are either mounted on a tube trailer vehicle chassis, a tube module equipped with an ISO frame, in cradles or in a disassembled position. The cylinder must have a minimum wall thickness no less than 0.400 inch. In place of the hydrostatic test and internal visual inspection prescribed in § 173.34(e), each cylinder must be examined by acoustic emission test and, as required, by ultrasonic examination.

b. TESTING - Each cylinder must be subjected to an external visual examination in accordance with the Compressed Gas Association Pamplet C-6 and retested by AE/UE at least once every five years in accordance with the procedures specified in the CPI application for exemption on file with the Office of Exemptions and Approvals (OHMEA) and as prescribed in this exemption. A cylinder that has been exposed to fire or to excessive heat (temperatures of 1000°F. or greater) may not be retested under the terms of this exemption.

(1) AE Equipment:

The AE equipment must be in accordance with the specification described in the CPI application for exemption on file with the OHMEA and as prescribed in this exemption.

(i) Power supply, signal cable, signal processor and couplant must meet all requirements of the American Society for Testing and Materials (ASTM), E 1419-96 Standard Test Method for Examination of Seamless, Gas-Filled, Pressure Vessels Using Acoustic Emission.

(ii) AE Sensors must meet all requirements of ASTM, E 1419-96 except the broad band sensor must have the frequency band of 20 KHz to 2.0 MHz.

(2) AE Calibration and Standardization:

Calibration and AE equipment performance and test procedure must be in accordance with ASTM, E 1419-96 and the CPI test method described in the CPI application for exemption on file with OHMEA, except as specifically stated herein:

(i) System performance check described in ASTM E 1419-96 must be performed by pencil lead break or electronic pulsar on the cylinder surface at a minimum distance of 4-inches (10-cm) from the sensor. The AE signal for each sensor during performance check must have a sensitivity equal or greater than 70 dBV.

(ii) Each acoustic emission (AE) site on the cylindrical portion of each tube which produces five or more valid events within an 8 inch axial distance must be subjected to an ultrasonic examination (UE) as prescribed herein. Each AE site on tube ends (i.e. sections of the tube which lie outboard of the sensors) which produces five or more events which hit both sensors and which produce 43dB or greater peak amplitude at the "first hit" sensor, must be subjected to UE.

(iii) The rejection criteria as established by fracture mechanics for the cylinders retested under this exemption is a flaw with a maximum depth of 0.100 - inch (0.254-cm).

(3) UE Equipment performance, calibration and test procedure:

The UE equipment performance, calibration and test procedure must be in accordance with the specification described in the CPI application for exemption on file with OHMEA and as prescribed in this exemption.

(i) As a minimum, the ultrasonic examination (UE) equipment used must have an examining capability at frequencies from 1 to 5 MH_z. The instrument, search units and related equipment must be the pulse echo type and be capable of detecting and measuring the reference standard notches. The ultrasonic instrument shall generate an A-scan display, showing signal amplitude and distance locations of the reference standard notch.

(ii) UE Reference Standard (Calibration Ring) must be cut from the same type cylinder that is being examined. The reference standard must have the same nominal diameter, wall thickness, material, heat treatment, and surface condition. A drawing representing the reference standard and a certification statement signed by a person certified as a Level III operator (in UE) must be available for inspection for each reference standard (calibration ring) at each site where testing is performed. A reference standard drawing must identify dimensions (length, width, and depth) of each artificial defect. Reference standard notches must be (square edge or "v" bottom) introduced on internal and external surfaces of the reference standard.

(A) One (Depth = 0.100", Length < 2", Width < 0.06") internal notch must be placed into a single reference standard (calibration ring).

(B) One (Depth = 0.100", Length < 2", Width < 0.06") external notch must be placed into a single reference standard.

(iii) Prior to ultrasonic examination, each AE indication must be clearly marked. A minimum of 6-inches of surface shall be scanned at each side of the marked location. Ultrasonic examination must be performed at service pressure.

(A) Circumferential scanning shall be performed in both clockwise (CW) and counter clockwise (CCW) directions to ensure adequate coverage of the marked location.

(B) For difficult to reach locations on cylinders which are stacked in the middle rows, the search unit may be mounted at the end of an extension rod. If an extension rod is used for testing, standardization must be under the same condition as testing.

(C) A Distance Amplitude Correction (DAC) curve must be used as a threshold for acceptance/rejection of a flaw's depth (0.10 inch) by determining the amplitude of the reflected signal from the flaw as a percentage of the DAC curve. Any detected flaw with amplitude that exceeds the DAC curve must be considered a potential for rejection. After the flaw has been located, it must be re-examined by scanning from several directions utilizing the first half-skip distance to confirm that the maximum signal amplitude from the flaw is above the DAC curve. To achieve maximum signal amplitude, circumferential scanning may be combined with a slow twisting motion to detect the part of the discontinuity that may not be oriented completely perpendicular to the incoming ultrasonic pulse. The cylinder containing the flaw may require removal from the stack to allow access to the flaw location.

(iv) When a removal of a cylinder from service is considered, another ultrasonic examination technique such as reflected tip diffraction may be used to accurately evaluate the flaw (depth, length and orientation).

(4) Rejected cylinders. When a cylinder fails external visual inspection or meets the rejection criteria of paragraph 7(b)(2)(iii), the retester must stamp a series of

X's over the DOT specification number and marked service pressure, or stamp "CONDEMNED" on the shoulder, or neck using a steel stamp, and must notify the cylinder owner, in writing, that the cylinder is rejected and may not be filled with hazardous material for transportation in commerce.

(i) Alternatively, at the direction of the owner, the retester may render the cylinder incapable of holding pressure.

(ii) If a condemned cylinder contains hazardous materials and the testing facility does not have the capability of safely removing the hazardous material, the retester must stamp the cylinder "CONDEMNED" and affix conspicuous labels on the cylinder(s) stating: "UT REJECTED DOT-E 12413. RETURNING TO ORIGIN FOR PROPER DISPOSITION". A current copy of this exemption must accompany each shipment of condemned cylinders transported for the disposal of hazardous material.

c. Marking - Each tube trailer must be marked as follows:

(1) An exterior tube on each side of a tube module must be marked with letters at least 2 inches high on a contrasting background "DOT-E 12413".

(2) The exterior of the trailer cabinet of the vehicle chassis to which the cylinders are affixed must be marked with letters at least 2 inches high on a contrasting background "DOT-E 12413".

(3) The current retest date must be marked on the rear bulkhead inside the trailer cabinet at approximately eye level above the withdrawal valve for tube trailers and on the bulkhead near the withdrawal valve for tube modules. In the event retest dates of cylinders differ in a trailer cluster, the retest date displayed will be that of the oldest retest date, meaning the date of the retest that must occur first.

d. Report - A report must be generated for each cylinder that is examined. The AE/UE report must be on file at the test site, and made available to a DOT official when requested. The acoustic emission and ultrasonic examination (AE/UE) report must include the following:

(1) AE/UE equipment, model and serial No.
(2) Transducer specification (mtg, size, angle and frequency).
(3) Specification of the standard reference used to UE the cylinder. Standard reference (calibration ring) must be identified by serial number or other stamped identification marking.
(4) Cylinder specification and serial no.
(5) Maximum allowable filling pressure.
(6) Minimum prescribed sidewall.
(7) Number of events at each location.
(8) Pressure associated with each event.
(9) Description of each AE event (amplitude, duration, energy, etc.)
(10) Size of each defect measured (length and depth).
(11) Type of each defect measured (crack, pitting, etc.)
(12) Defect location relative to each sensor.
(13) Defect location relative to sidewall (interior, outer surface, inner surface).
(14) AE/UE technicians' name and certification level
(15) Test Date
(16) Acceptance/rejection results.

e. Personnel Qualification - Each person who performs retesting or who evaluates or certifies retest results must meet the following requirements:

(1) Project Manager - is the senior manager of CPI responsible for compliance with DOT regulations including this exemption. Additionally, the project manager must ensure that each operator and senior review technologist maintain the required ASNT certification.

(2) The personnel responsible for performing cylinder retesting under this exemption shall be qualified to an appropriate Level (Level I, II or III)- acoustic emission and ultrasonic examination (AE/UE)in accordance with the American Society for Nondestructive Testing (ASNT) Recommended Practice SNT-TC-1A-1996 depending upon the assigned responsibility as described below:

(i) As a minimum, a Level II Operator must perform system startup, calibrate the system, and review and certify the test results when a written acceptance and rejection criteria for cylinders

have been provided by a Senior Review Technologist. Based upon written criteria, the Level II Operator may authorize cylinders that pass the retest to be marked in accordance with paragraph 7(c) of this exemption. However, a person with Level I certification may perform a system startup, check calibration, and perform AE/UE under the direct guidance and supervision of a Senior Review Technologist or a Level II Operator, either of whom must be physically present at the test site so as to be able to observe examination conducted under this exemption.

(ii) Senior Review Technologist (SRT) - is a person who reviews overall test results, provides supervisory training and technical guidance to operators, and reviews and verifies the retest results. A SRT must have a Level III Certification in AE/UE, and a thorough understanding of the HMR pertaining to the re-qualification and reuse of the DOT cylinders authorized under this exemption. The SRT must prepare and submit the reports required in paragraphs 7(d) and annually verify that the AE/UE program is being operated in accordance with the requirements of this exemption.

f. OPERATIONAL CONTROLS -

(1) No person may perform inspection and testing of cylinders subject to this exemption unless -

(i) that person is an employee or agent of CPI and has a current copy of this exemption at the location of such inspection and testing, and

(ii) that person complies with all the terms and conditions of this exemption.

(2) The marking of the retester's symbol on the cylinders certifies compliance with all of the terms and conditions of this exemption.

(3) Each facility approved by OHMEA to test cylinders under the terms of this exemption must have a resident operator with at least a Level II Certification in AE/UE.

8. SPECIAL PROVISIONS.

a. Each facility located in or outside the United States where DOT 3AA, 3AAX or 3T cylinders (tubes) are to be tested under this exemption, must obtain an approval under 49 CFR part 107, Subpart H, and in accordance with the provisions of §§ 178.37 and 178.45, for retesting by means other than the methods required in § 173.34(e).

b. Cylinders retested in accordance with paragraph 7 above may be charged to 110 percent of marked service pressure in accordance with § 173.302(c).

c. A report identifying the total number of cylinders tested under this exemption must be sent to DOT on an annual basis. The report must be summarized to include the information outlined in paragraph 7(d)(4)(10)(11)(12)(13).

d. A statement of qualifications, for each "qualified AE/UE tester" used under this exemption and information in support thereof, must be maintained by CPI. The location of this statement, for each "qualified AE/UE tester", must be identified to the OHMEA.

e. A person who is not a holder of this exemption who receives a package covered by this exemption may reoffer it for transportation provided no modifications or changes are made to the package and it is reoffered for transportation in conformance with this exemption and the HMR.

f. A current copy of this exemption must be maintained at each facility where the package is offered or reoffered for transportation.

g. Motor carriers operating under the terms of this exemption must have a "Satisfactory" or "Conditional" safety rating as prescribed in 49 CFR Part 385.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight and cargo vessel.

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel or motor vehicle used to transport packages covered by this exemption.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this exemption and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

    - o All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
    - o Registration required by § 107.601 et seq., when applicable.

    Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by §§ 172.700 through 172.704.

    No person may use or apply this exemption, including display of its number, when this exemption has expired or is otherwise no longer in effect.

12. REPORTING REQUIREMENTS. The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable. (Sections 171.15 and 171.16 apply to any activity undertaken under the authority of this exemption.) In addition, the holder(s) of this exemption must inform the AAHMS, in writing, of any incident involving the package and shipments made under the terms of this exemption.

Issued in Washington, D.C.:

SEP 7 2000

Robert A. McGuire
Acting Associate Administrator for
Hazardous Materials Safety

(DATE)

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590. Attention: DHM-31.

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The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

Copies of exemptions may be obtained from the AAHMS, U.S. Department of Transportation, 400 7th Street, S.W., Washington, DC 20590-0001, Attention: Records Center, 202-366-5046.

PO: MM Toughiry